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ARE WE BIOLOGICALLY EFFICIENT?

THE fitness of any species is most vitally tested by its ability to replace itself. In Britain, every 1,000 women of child-bearing age are now producing only about 760 potential mothers of the next generation. By this standard, therefore, we are biologically inefficient.

This failure is no new thing. For more than a quarter of a million years various types of humanity have waxed and waned—the prey of adverse natural conditions or of human, animal, insect, or bacterial enemies that they could not withstand. But it is unique because it is happening at a time when man's power to control his environment is historically unsurpassed. We are the unwitting victims not of some inimical external force, but of the social traditions we have ourselves evolved.

It would be wrong, however, to regard this threatened racial exhaustion as an isolated problem. Individually and as a community we are in general falling short of the level of well-being we might enjoy—less through lack of material resources and knowledge than because of a failure to apply these in the truest interests of all. It is our personal and social standards that are at fault; and a new and wider conception of the possibilities of education is needed to put them right. In this new approach, health education must play its part.

There have been three broad phases in man's attitude to health. For long he was entirely on the defensive against the mysterious forces of disease; and his only aids were the slowly increasing skill and knowledge of his priests or doctors, and a sustaining belief in magic. He therefore thought almost purely in terms of the treatment of established disease, or of warding it off by spells, potions and incantations.

Then advances in knowledge of the biology of disease made it possible to develop the science of preventive medicine, especially

during the last hundred years. But the focus was still on disease rather than upon health, and the responsibility rested with a small group of specialists.

Now, however, we are entering a new era with immense possibilities. Although disease still has its notable victories, the heat of the battle is no longer so intense; and we are within sight of gaining the initiative. We have made two great mental strides: we have now before us the positive ideal of the highest possible level of health for everybody, and we have recognised that this ideal can be reached only if the health-lore of the specialists becomes the common possession of all. We are beginning to see that being well is more than merely not being ill; and we are groping towards this standard not only for the individual but for the community, and the race.

Although still in its infancy, the science of psychology has given us a better understanding of the deep-seated hungers and urges of man. The power of the mind over the body, and the necessity for emotional as well as physical satisfaction, are therefore now more generally appreciated. But we must not forget that the motor factor plays an essential part in our mental and emotional development, and that there is an instinctive need for physical self-expression. The relationship of the mind and the body is a true interaction, the well-being of the one being bound up with that of the other.

Man reacts to every stimulus in a complex way, involving mind, body and character. Disease is not an interesting pathological process occurring spontaneously in inert material; it is a dynamic change affecting in some degree the whole individual, and the consequence of a definite chain of circumstances. In the same way, health is not static; it is a fluctuating condition—the resultant of many conflicting forces.

Our aim is to help the individual, the community and the race to reach and maintain a state of all-round development well above the threshold of biological efficiency. This will not be done merely by providing everybody with the material necessities of a healthy life. Each individual citizen must have a sense of his own possibilities and of his responsibility for the well-being of himself, his family and his fellows. Our task is to see that he is given the inspiration and the knowledge that he needs.

MESSAGE FROM THE CHIEF MEDICAL OFFICER OF THE MINISTRY OF HEALTH

THE attack, on a national scale, against diphtheria began in 1941. In the two years since then about half the child population has been protected. We have now to raise this proportion to at least three-quarters, because, until we do, the risk of a diphtheria epidemic will still remain. We know from investigation that parents are moved to action more by the personal recommendation of someone they know and trust—their local Councillor, the family or clinic doctor, the school teacher, the school nurse, the health visitor, the district nurse—than by anything else. Will you give us your personal help?

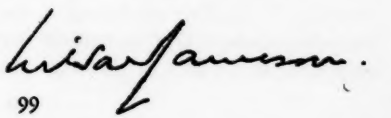
In 1942 we immunised 1,400,000 children, or about 28,000 a week. The greatest progress was made with children under 5, and for this, I think, we have to thank the health visitors. In earlier years we made most progress among the school children. That was due to the splendid missionary work of the school teachers and school nurses. If we all pull together this year we ought to gain our objective.

The Ministry and the Central Council for Health Education are intensifying national propaganda this summer—the summer is the season for immunisation because diphtheria is most prevalent from October to March, and protection takes three months to develop. But National Propaganda does not by itself produce results—it needs the support of local publicity, and particularly of personal persuasion.

Some day, I hope, every child will be immunised automatically on its first birthday. The process is safe and simple. There's nothing experimental about it. It has proved its value. The number of diphtheria deaths in this country last year was the lowest ever recorded. The death-rate for children under 15 was 14 per cent lower than the best ever recorded before. So we are beginning to see some results for all our efforts. We do not claim that immunisation will protect all the children all the time, but we can now say that an immunised child is 30 times as safe from death from diphtheria an an unprotected child.

Diphtheria still takes someone to hospital every 15 minutes, however, and it kills someone every 5 hours. Most cases occur in children under 10, and most deaths in children under 5. Diphtheria is a long and painful illness, and even when it does not kill it may have serious after-effects.

There is much ignorance or laziness or thoughtlessness to overcome. I am confident that readers of *Health Education* will help us to do it.



SHALL OUR NATION LIVE OR DIE?

By C. Margaret Burns, M.A.
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The question has recently been posed, "Shall our children live or die?" It would be equally pertinent to ask "Will they be born at all?" That we are failing to replace our population generation by generation is now well known. A generation ago we had six million children in our schools. Soon we shall have only four million. At our present rate of reproduction, race extinction is in sight. Scientists have been pointing this out for some time, but only recently have our politicians grasped its significance.

For a generation several nations have been making efforts to increase the birth-rate without measurable effect, though in the Germany of the thirties the exclusion of women from much paid employment and the giving of marriage grants may have brought a few children into the world earlier than would otherwise have happened, without increasing the final numbers produced. Can this apathy be changed? No certain answer can be given, but there are several facts of great importance which are usually overlooked and need to be stressed. First, the greater part of the real improvement in the health of women and children has been solely due to the decrease in the size of family, and women know this. Children of the size of family typical of to-day had death-rates only slightly greater in 1900 than now. Even in 1880, when sanitation was poor, school facilities scanty, social services nil and scientific knowledge of diet negligible, the children of these small families enjoyed a highly superior standard of health. Moreover, their low death-rate continued through life, that is, they were the "fit" people.

The statistics which prove these statements can be found in the report on *Infant and Maternal Mortality in Durham* (Burns, 1942), *Reports on Public Health and Medical Subjects* (Janet Campbell, 1929) and the *Special Report of the Registrar-General on Fertility, etc* (1911). From many statistics relating to the health of women of varying ages, classes, races and occupations at different times, which are collated and reviewed by Burns, it is clear that the main factor in improving women's health has also been the fall in the birth-rate. We have solved no problems. We have merely found them difficult and turned our backs on them.

Our civilisation is a civilisation of negation. The position need not be hopeless. In the Durham survey it was found that where first, second or third children were born to mothers between 20 and 35, and fourth, fifth or even sixth to mothers of 35 to 40, the infant and child death-rates were

remarkably low although the population as a whole was suffering from the most depressing poverty. Moreover, even these low figures were higher than they might have been if due care for biological needs had been exercised, since all the groups contained some families in which the rate of breeding was too rapid for maternal or child health.

The human ovaries at birth are said to contain about 30,000 ova. Of these not more than 400 mature, and we know nothing yet of what determines which these are. Of these 400, only a very small number can be fertilised, and this may be achieved by any one of millions of spermatozoa. It is not therefore remarkable that under these circumstances the occasional unhealthy cell may play its part in reproduction and that biological misfits are born. It would seem more remarkable that under the best social conditions biological weaklings are not commoner. It is probable that even if reproduction were only undertaken with the exercise of the greatest knowledge and prudence, a considerable number of people would be born who would need special care; but there is no doubt that their numbers could be greatly reduced if marriage took place at a suitable age (from 20–25) and if children were only bred at a rate compatible with the health of mother and child. The average figures have already been indicated, but in this, as in all things, individuals differ and the woman herself would probably always be the best judge, if she were in possession of the facts which ought to be given to her.

The stressing of the biological factors in health introduces nothing new. The horticulturalist disbuds the young plant. The stock breeder carefully watches the age and rate of breeding of his animals (and never does he race a mare at stud.) The experimentalist in his laboratory (Cox and Imboden, 1936) has shown that age of mother and rank of litter can make tremendous differences to the number and viability of the young. The bearing of all this on human health is obvious.

If a numerically stable population is desired, it could be achieved generation by generation, in theory, if every female and male born survived to marry and produce another female and male. (It is fashionable to concentrate interest on the female, and this is biologically correct, but in a country such as ours where the traditions of legal matrimony are strictly monogamous and extra-marital production of children is frowned on, the necessity for producing one male for every female is obvious.) Since the sex ratio at birth always approximates 1 : 1, this simply means that each two people must be replaced in the next generation by two others, but some do not live to produce children, and some do not marry although they live long enough.

The second fallacy which needs stressing is the silly remark so often made by the half-educated that the female is the stronger sex, because now, in our own country where women are subjected to much protection which might equally well be called restriction, the death-rate of the male is higher

than that of the female. Even here this is not true for the natural death-rate, until after the close of the reproductive period; and accident rates give no clue to health. In primitive countries the total death-rate of the young female always exceeds that of the male. To change this by "protection" is all very well, but "protection" is not stimulating.

Thirdly, ideas about fertility in the past are wild in the extreme. In his special report on fertility in 1911, the Registrar-General quoted figures to show that in 1874 the average size of family was 5.39, and reviewed the position from 1880 to 1910. He said :"Amongst all marriages, the 10% least fertile produced no births, the least fertile 20% produced 1% of the total births recorded, the least fertile 25% produced 2·4% of the total births, and so on to the least fertile 90% which produced 70·5% of the total births, the share of the most fertile 10% of all the marriages being therefore 29·5% of all the births. The main point brought out is the extent to which the recruitment of the population results from a comparatively small proportion of the marriages." He also quotes Pearson as saying that a quarter of the marriages produce half the population. This was at a time when the birth-rate was high, and it seems probable that much of the low fertility described represented involuntary sterility and there is probably more of this to-day than is generally realised. This is essentially a medical problem. Unfortunately problems of human reproduction are buried beneath layers of smut, sadism, superstition and sentimentalism, which make anything like a rational approach difficult.

In her book *The Parson's Wife*, Watt brings the Registrar-General's figures to life. She describes 26 families but does not give the number of children in two of them. The 24 produced 192 children—an average of 8. This may not have ever been typical since some families seemed to be chosen for mention primarily for their size. [It is interesting to note here that parsons now share with teachers the distinction of having the smallest families.] Two families had no children, three women died in childbirth with their first child and three others died at or shortly after the birth of their second child. On the other hand, five families produced 90 children. These figures have no statistical significance because of their paucity, but they emphasise the fact that the burden of maintaining the population has always fallen on the shoulders of a handful of women in each generation. The main fall in the birth-rate has consisted of restricting these large families. Can we intelligently do anything about population problems until we know what women think of the burden so unfairly thrust upon them?

Watt quotes Canon Anson as saying "My mother, I know, often felt it to be an intolerable burden, but she faced it with a high courage, offering each child solemnly to the service of God, awaiting the birth of each child, as she used to say, like a man going into a battle" (cf. G. B. Shaw, *Press Cuttings*). Here we have total self-immolation. At the other end of the

scale Margaret Rawlings describes an old negress on her plantation. " 'I was a fast breedin' woman,' Martha says with dignity and without apology. Such things are elemental, a matter of fact. I got sympathy, for a woman is a fast-breeder." Here we have the life but little above the animal—those to whom things simply happen. Can we hope for general self-immolation? It seems improbable. Must we return to the animal? The prospect is unattractive. Is it already too late to begin to use our brains? The pontifications of our pundits, particularly the economists, always suggest that these gentlemen were never born at all, but were just found under a peculiarly shady gooseberry bush, produced there by some miraculous process of strictly male parthenogenesis.

Marriage must now be differentiated from motherhood. Primitive races found it only necessary to marry their girls to perpetuate their species. Motherhood may be regarded as either a punishment, a pain, a pleasure, a duty, or a profession. If it is either of the first two, few can be expected to embrace it voluntarily and frequently. As far as it is a pleasure, it can safely be said that apart from an amount of involuntary sterility, women already have the children they want, and race extinction looms ahead. If we accept it as a duty we must ask why, and to whom? Moreover, duty is two-edged, and we live in a country which spends £3,000,000 a year on maternity and child welfare schemes, £12,000,000 a year on the maintenance of its blood stock, and in the last year of peace £450,000,000 a year on alcohol and tobacco. Comment seems superfluous. If we regard Motherhood as a profession, we must expect that if certain financial arrangements are made a large part of our population will be produced by a few women of the dominantly maternal type. Is this desirable? If we merely want hewers of wood and drawers of water or cannon-fodder, it probably does not matter. (It might, however, be noted that the amount left to pay the mother when a child has been fed and clothed on 8s. a week is not great. As a profession Motherhood is a bit sweated. Is the epitaph of our civilisation already written "Just too little and too late"?) We must face the fact that each child must be wanted, conceived, carried, born and reared. In the rearing many may play a part, but the burden of the rest falls on the mother. When famine and pestilence were just round the corner and hangings and floggings were regarded as suitable occasions for family festivities, pregnancy and parturition may well have seemed unimportant (though this view was not held by the author of the Book of Genesis). Women to-day even in the poorest homes have found that they can protect their own health and that of their children, and ensure some level of comfort much more effectively by restricting their families than by any other means. Moreover, they remain mistress of their own lives to a degree which cannot be achieved in any other way. It must be remembered that the necessity to stay at home and wash the baby's bedding and darn the boy's socks is just as galling to a woman who wants to

run a charity meeting as to one who wants to play bridge. It is essential to realise that women are as varied as men, and that while some women would wish to devote their time to the personal attention of their children, some would wish to make Motherhood as incidental in their lives as is Fatherhood to men. It is necessary to work within biological possibilities, but have we fully explored biological possibilities? We need a more elastic society with wider ideas and deeper thoughts. Men design a society solely for their own benefit and then whine because women refuse to perpetuate it for them. Women themselves need to think much more clearly, honestly and courageously. They suffer so much more than men from the ministrations of the half-baked and outline-educated, from pseudo-science and fake philosophy.

Our whole health services are in the melting pot. Many things might be said of them, but one must be said. The only opinions which matter fundamentally about our obstetric and allied services are the opinions of the women who may need them, because if they do not like them, they may just not need them. When we have built Jerusalem in England's green and pleasant land, it will be slightly silly if we only find there is no one left to live in it.

BIOGRAPHICAL NOTES

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Leslie George Housden, M.D.—Attracted to medicine through wish to improve lot of children. Studies interrupted by active service, 1914–1919. Studied at Guy's Hospital, Evelina Hospital for Children and Hospital for Sick Children, Great Ormond Street. General practice since 1925. Chairman, Parentcraft Committee, National Association of Maternity and Child-Welfare Centres. Married—four children.

THE NEED FOR NATIONAL INSTRUCTION IN PARENTCRAFT

By Leslie Housden, M.D.
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The standard of child-welfare in this country is too low. This will be confirmed by all who are familiar with the insides of our homes and with what passes within them for family life.

The condition of many of the "evacuated" children was so degraded that public opinion was shocked. The migration of these children was widespread, the horror and the shame that they aroused spread even farther. This was one of the advantages of war. Nothing that those who knew previously of this condition had been able to do had attracted any but the most sporadic interest, either public or official, but from its rude awakening by the evacuated children, public interest began to take notice of the nation's childhood as a whole. It found no cause for self-congratulation. Juvenile delinquents were found to abound—twenty-eight thousand annually before the war, forty-one thousand in 1941. Reports were made of the habits and abilities of new entrants into the women's services. Thousands were found to be entirely undomesticated. They had never turned out a room nor lit a fire. They could go for days without washing. A statement was made in the House of Commons of the wanton damage to railway carriages and cinemas. In some parts, children's cinema matinees had to be discontinued owing to the destruction of the seats by the children. Thieving and pilfering were general. Prisoner-of-war parcels were rifled at the docks, the lifeboats of ocean-going ships were robbed.

It was a very gloomy picture of wrong-living and wrong-doing by children, by those who were recently children and by those who had children of their own to guide. It was the obvious sign of a national cancer, but not the only sign. The evil spreads further. The more obvious signs are displayed in the Press and in the Courts, the less obvious are seen in the children's homes.

The number of children who are mismanaged in these homes must be very great indeed. They are found in every street. Their presence is recognised by the frequent scolding of the parents, the constant disobedience of the children, the poor appetites, the shortened hours of sleep, the fretfulness, the ill-humour and the lying. It is absurd to think that married couples enjoy such a way of living. Whatever their reasons for marrying, it was never to enable them to live a life of ill-tempered misery. Marriage did not start that way. It started happily. Side by side with this state of mental

unrest goes the poor state of health of so many of our children. This is another aspect of the gloomy picture. They are not ill but they are ailing, yet nearly every one started life in good health.

These conditions, physical and mental, are found in a country which has long enjoyed compulsory education on a national scale and a vast and ever-expanding organisation for the welfare of children. Something, then, must be wrong. To what can we ascribe the blame? Poverty? Bad conditions of housing?

Juvenile delinquents, neglected, mismanaged and ailing children are not confined to the poor. If they seem to be so limited, it is because usually the better-to-do the family the greater the disposition and the ability to conceal such defects in it. The degradation of even the worst of the evacuated children could not be attributed to poverty. Some of them had half a crown weekly as pocket money to spend on inferior sweets and "comics," and considerable sums were spent regularly on cigarettes and in unprofitable ways, such as gambling.

Nor can the blame fairly be attributed to bad housing. Inconvenient, work-making houses are undoubtedly the torment of many housewives in all ranks of life, but some of the families from the worst quarters of the evacuated areas had been moved, before the war, into brand-new council houses without any improvement whatever in their standard and mode of living or in cleanliness. Yet their children, when given, during the evacuation, into the care of kindly and instructed foster-parents, ceased to be the horrible children they had been under their own parents and became attractive and lovable. Examples of happy and creditable family life in bad houses are known to all who take a practical interest in home life. The secondary position played by the house in promoting the well-being of the home is also seen in neighbouring houses of any street, where one contains a happy, affectionate family and the other a discontented, cantankerous collection of individuals, both households having similar houses and equal incomes. It is not the houses, it is not poverty. What is it?

The chief hindrance to the progress of our child-welfare is the mistake of teaching the principles of child-care to all except those who are actually going to practise it. More and more the responsibility for our children is being taken over from their parents by local authorities. Points concerning the health and guidance of the children are taken for solution automatically to members of the public welfare-services. The parents cannot solve them, and make no attempt to do so. Worse still, they do not wish to. With the release from responsibility for children, for whose existence they alone are accountable, their interest in them diminishes. This creates an impossible situation, for interest in the children is the foundation of all child-care. If the children are to be taken entirely from the care of their parents, then the modern trend is good, but if family life is to continue and if children

are still to live at home with their parents, those parents will exert an influence greater than any outside force. This is evident. In many of our schools, the precepts and examples of the teachers are excellent, but they cannot bear fruit in the characters of their pupils unless they have the support of similar precepts and examples in those pupils' homes. However often a child may write at school "Thou shalt not steal," his integrity will not survive an atmosphere of dishonesty at home. This being so, and in principle it is indisputable, the line of action is clear. The standard of parentcraft must be raised.

The rearing of any child is not a matter of instinct. Civilisation has imposed too many unnatural obligations for the employment of unrestrained liberty. The instinct of a hungry child is to eat. If the food belongs to someone else, his instinct will lead him into trouble. The instinct of an adult leads her to fold a nervous child protectingly in her arms. There are few surer ways of establishing his fear. Affection for children seems to be instinctive, but for their rearing and guidance in a land where certain civic and social rules must be kept, intelligence must augment instinct and the use of that intelligence is a matter for education. Parents must be trained to rear and guide their children. The maintenance of inborn health is neither difficult nor complicated if the principles involved have been learnt. A happy childhood is not difficult to provide if parents have been shown what knowledge and unselfishness on their part are needed for its provision. It is common for prospective parents to dream of their future child, so lovable, so admired, so good. What they do not foresee equally clearly is the thought, the co-operation and the careful example that are needed to produce such a wonder. This must be taught and should be taught to every parent.

How is this possible? If arrangements were made for instruction in parentcraft to be given on a national scale, how would the parents be persuaded to receive it? Only the best of the parents would welcome such teaching. The ones who needed it most would stay away, and they could not be forced to attend. In this matter they are beyond help. It is deplorable that so many bad, uninstructed, lazy parents should exist in a child-loving country, half-way through the twentieth century, but it will be nothing short of a national disgrace if more are allowed to appear in the next generation. The parents of the next generation are now all at school, where until the age of fourteen—and soon it will be fifteen or sixteen—they are going to be taught something whether they like it or not. Here is the chance to teach them something that will transform their lives. What shall it be?

Domestic unhappiness is largely a matter of weariness and anxiety. The mother is usually chronically tired. Lacking the knowledge required to organise her day and save herself work, to prevent waste and to make good use of the family income, she never ceases to be busy from early morning till late at night. Her house is always in a muddle and is never clean, not

because she would not like it to be clean, but because of her inability to keep it sufficiently tidy to be cleanable. Her children add to the domestic turmoil and fill her with anxiety. She can neither preserve their health nor control their behaviour. They are a nuisance, which she is only too ready to hand over to someone else. Her husband is rarely of real help. He is irritated by the general unrest of his home and opposes his wife in her treatment of the children. There is a sentimental attachment combining the various members of the family, but the conditions under which they live prevent any display of real affection. That is the existing state in tens of thousands of our homes, described in the general terms imposed by so short an article.* Its improvement is a matter for pre-marital education. Lazy housewives and neglectful parents will always exist, but they should exist only in spite of education, not through lack of it. Every boy and girl should be taught how to rear a happy family in an attractive home. It matters little where this knowledge is obtained so long as it be adequate for its purpose. In good homes, it is acquired by daily observation and by a process of gradual instruction in house-care and social adjustment, without any actual lessons at all. In many of our homes, parents are unable to give this teaching, which must therefore be provided by others.

The teaching, which can be called "Mothercraft" for girls and "Home-Building" for boys, is concerned with everything that helps in the healthy rearing of happy children. It is related to but separate from sex-teaching and preparation for motherhood. The feeding, clothing and bathing of infants forms only a small part of it. Its main concern is to teach how initial well-being may be preserved. It tells, not of the struggle against disease, but of the preservation of inborn good health, of the retention of the original orderliness and comfort of the home, despite the unsettling irruption of children, of the maintenance of the highest possible standard of living on the available means, of the retention of that joy in living that is natural to every child. For boys, it reveals the duties and responsibilities of fatherhood, of which many of the fathers of to-day are quite unaware. Besides the actual "technical" instruction, the subject bears a definitely moral value, for such qualities as selfishness and lax morality are incompatible with good parent-craft.

There is no obstacle to the immediate institution of this teaching on a national scale. The children enjoy it. Onwards from the age of ten, there is no schoolgirl for whom the subject is unsuitable. The teaching is adjustable to the age and mentality of the pupils. The subject is full of interest, and its fascination for the pupils can be maintained by teachers of sympathy and ability. The fund of potential teachers is great, the necessary qualifications being an intimate knowledge of and deep sympathy with the subject, the

* A fuller account of the whole subject will be found in *The Parents' Responsibility* by Dr. Housden, distributed by Messrs. Eyre and Spottiswoode.

ability to teach it in an arresting and vital manner and familiarity with the types of homes from which the pupils come.

Suitable teachers of girls would be those with the following qualifications: (1) State registration in nursing, (2) Health-visitor's certificate, (3) Adequate experience (e.g. two years) as health visitor, and (4) Instruction in teaching, but there would certainly be many suitable teachers of "Mothercraft" without such qualifications. Aberdeen, with its two full-time teachers of "Mothercraft" for schoolgirls has set an example to the whole country.

It is time that the ruin of children's health and happiness through the haphazard "care" of their uninstructed parents should end. The official, who is not aware of the urgency of the need for this teaching is not aware of the home conditions of the children, whose official protector he is. The finance committee who recoil from its cost are only studying one side of the equation.

The more parents know about their children, the less those children will cost the State. All normal infants can be reared through a healthy and happy childhood by their own parents with small expense to the State, provided those parents are instructed. Yet millions of pounds sterling are spent annually on hospitals, convalescent homes and clinics, on juvenile courts, approved schools and probation systems, in endeavouring to recover physical and mental health which should never have been lost. Parentcraft-teaching in school is a money-saving plan and would enrich the Treasury.

Much money to-day is wasted on "education." The parents of all the "horrible" children of the evacuation and of the juvenile delinquents went to school. If some of their "education" had been replaced by the teaching of parentcraft it is unlikely that their children would have cost the State so much in money and the nation so much in reproach. If children are not sent to school to prepare them to live as usefully as possible to their neighbours and themselves and to enjoy their lives as fully as possible, it is difficult to see why education is compulsory. The rearing of their children forms a large part of the lives of most adults, particularly of women. Let them be prepared for it.

CENTRAL COUNCIL FOR HEALTH EDUCATION
SUMMER SCHOOL

The Summer School in Biology and Health to be held at the Chelsea Polytechnic from 4th to 14th August, is evidently meeting a real need. The number of applications is many times that expected, and the Summer School Sub-Committee has made alterations in the programme which will make it possible to admit 200 students. Even with this figure, it will still be necessary to disappoint very many who wished to attend, but it is hoped that next year it will be possible to make arrangements to cater for a larger number of students.

THE BIOLOGY OF INFECTION* 1. THE SEED

By Robert Cruickshank, M.D.Aberd., M.R.C.P., D.P.H.

Infection is an experience of everyday life. The baby with bronchitis or measles, the boy with boils or diphtheria, the growing girl with consumption, the husband with pneumonia, are all examples of infection, and infection means an attack upon our bodies by living agents so small that only the bacteriologist with his special stains, his culture media and his microscope can demonstrate their presence. In ancient times infectious disease, or the plague as they then called it, was regarded as a divine visitation for wrong-doing. Later it was attributed to a disturbance of the body's humours, and more recently smells and emanations from sewers and putrefying matter have been blamed. Even to-day many of us have very vague ideas about the sources and spread of infection. If we knew more about it, we could as intelligent citizens help to control the ravages of infection which still claims as its victims one in every five of those who die, and causes besides a vast amount of suffering and invalidity.

The Struggle for Food

The dominant instinct in all animal life is to find enough food to eat and in turn to avoid being eaten or destroyed. In the search for food animals tend to be either predatory or parasitic. By predatory we mean those animals that survive in the struggle for existence by eating other, usually smaller, animals; true, many animals are herbivorous, deriving their food directly from plant life, but many others are carnivores and form some part of what we call a "food-chain." For example, a shark feeds on large fish which in turn feed on small fish; the small fish live on crustaceans, which feed on protozoa, which live on the microscopic green algae. Other animals, mostly very small, live as parasites on the tissues of larger animals. They derive their nutriment at the expense of their host, and their continued existence depends on the continued existence of the host. Many bacteria, including those that cause disease, all the even smaller viruses, many protozoa and worms, are living this parasitic life, growing and multiplying at their host's expense. From the parasite's viewpoint, the bacteria and viruses that make men sick are fighting for their own survival rather than for the destruction of their host. They would probably prefer the host not to sicken and die, but unfortunately for us they must damage the host's tissues if they themselves are to survive and multiply. Thus sickness appears as an accidental happening

* The first of a series of articles.

in the struggle for existence. Man, for his part, objects to being used as a source of food by microscopic creatures which do him harm, and the purpose of medical practice is to prevent attack by these parasitic enemies, or if they gain a foothold, to localise the damage they do and drive them out as soon as may be. Nature would prefer a state of equilibrium, which allows both host and parasite to survive without great damage to either, and we shall discuss this host-parasite relationship later. Meanwhile, let us examine these microscopic organisms more closely and enquire how they became our parasitic foes.

The Parasites and How They Live

There are three main groups of parasites which cause infection in man, namely bacteria, viruses and protozoa. To these may be added a few fungi or higher bacteria which cause skin diseases like ringworm, and certain worms, from the hook-worm which is a major cause of sickness in some tropical countries to the familiar tape-worm which by infesting our intestine causes bloodlessness.

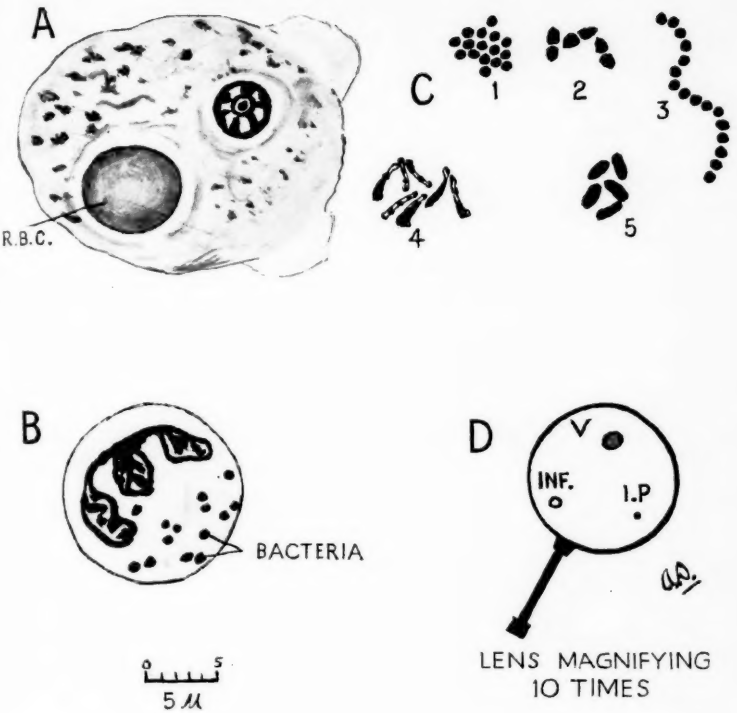
Bacteria are extremely small compact masses of living material occurring as spherical *cocci* or rod-shaped *bacilli*. Some of the cocci occur in clusters or *staphylococci*, others in pairs or *diplococci*, and others again in chains or *streptococci*. To give some idea of their size: it would require a chain of 30,000 cocci to stretch one inch. They live on the same kind of food as we do, requiring mostly protein, mineral salts, a little carbohydrate and plenty of water. Bacteria absorb their food by a system of intensely active ferments or *enzymes* some of which are capable of breaking down dead and decaying material to simple organic salts like nitrates and ammonia for utilisation by other bacteria which are unable to do so. Bacteria are thus the great scavengers of nature, and they have extended this scavenging action to our own bodies. They inhabit the skin, body cavities and, most of all, the intestine where unused particles of food afford a happy hunting-ground; indeed, about half of the bowel excreta consists of bacteria. It does not require much stretch of imagination to see how some of these surface scavengers were forced in the struggle for existence to attack the underlying body tissues, and it is here that a knowledge of the different bacterial species helps us to follow how the pathogenic or harmful types evolved. The bacteria that inhabit the skin as harmless scavengers are staphylococci and it is a particular member of this family, *Staphylococcus aureus*, which is responsible for most skin sepsis, such as pimples, boils and carbuncles. In the mouth and throat there are harmless streptococci, diplococci and rod-shaped bacilli from which have evolved the *Haemolytic streptococcus* causing tonsillitis and scarlet fever, the diplococci *meningococcus* and *pneumococcus* responsible, respectively, for meningitis and pneumonia, and the bacillus which causes

diphtheria. In the intestine the harmless *Bacillus coli* is indistinguishable in appearance from the organisms that cause typhoid and dysentery. The pathogenic members of these various families can be identified by certain special characters, a feature about them being that they are less hardy outside the body than their harmless relations. In other words, they have become more strictly parasitic.

Viruses are much smaller than bacteria, varying in diameter from 1/5th to 1/100th part of a coccus, and, even more significant, they cannot grow apart from living cells. They have become completely parasitic and require for their growth material already prepared by the enzymes of the host's cells. Some, like smallpox and chickenpox viruses, live in the cells of the skin, where they produce their characteristic pocks. Others, like the virus of infantile paralysis, have an affinity for nerve tissue and others again, like the influenza virus, grow on the lining membranes of the air passages. Since viruses are so completely parasitic they will not grow like bacteria on artificial culture-media, so that this method cannot be used to distinguish one virus from another or to prepare vaccines against the infections they cause. However, several other methods for getting viruses to multiply outside the body have been devised, one of which is the use of the developing unhatched chick, on the lining membranes of which various viruses grow freely. Vaccines against yellow fever and typhus have been prepared in this way.

Viruses are widespread in nature and are responsible for great economic loss among plants, birds and mammals, besides causing some of our commonest infections, for example measles, influenza and the common cold, mumps, chickenpox and herpes. They even attack bacteria (big fleas have little fleas upon their backs to bite them), which raised hopes that by setting a thief to catch a thief we might eliminate bacterial infection altogether. With a few dubious exceptions these hopes have not been realised.

Pathogenic ***protozoa*** include the causal agents of malaria, sleeping sickness and amoebic dysentery. They are the lowest forms of animal life, usually larger than bacteria although the malarial parasite is about the size of an average bacterium. Most protozoa are capable of active movement and they feed by ingesting micro-organisms and minute food-particles. The non-pathogenic types abound in pond-water, whence they pass to the animal intestine, and man harbours a variety of harmless types in his gut. Thus, *Entamoeba Histolytica*, the cause of amoebic dysentery, presumably evolved, like the pathogenic bacteria, from some harmless prototype, but instead of ingesting bacteria it feeds on the intestinal lining and the red blood cells of its host. Other protozoa became habituated to a parasitic life in insects and from them have been derived the highly specialised malarial *Plasmodium* and the sleeping sickness *Trypanosome*, which enter man's blood through the bite of their insect hosts, the mosquito and tsetse fly.



$1\mu = \frac{1}{1000}$ MILLIMETRE $= \frac{1}{27000}$ INCH

A. Dysentery amoeba with ingested red blood cell (R.B.C.).
B. Phagocyte (white blood cell) with ingested bacteria.
C. Bacterial types: 1. staphylococci, 2. pneumococci, 3. streptococci, 4. diphtheria bacilli, 5. typhoid bacilli.
D. Viruses (magnification 10 times that of other parasites): V. vaccinia virus. INF. influenza virus. I.P. Virus of infantile paralysis.

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The Host Parasite Relationship

When a lowly parasite attacks a higher animal it evokes various responses in the tissues of its unwilling host. These responses have probably developed from the primeval reaction of the amoeba which engulfs a micro-organism, recognises it as something foreign and proceeds to destroy it with enzymes. This recognition by cells of what is "self" and "not self" is general throughout plant and animal life, and it is significant that only when the invasion takes the form of unco-ordinated growth of the host's own cells (cancer) do the body tissues lack any defence. The skin's response to bacterial invasion after a cut is, first, dilatation of the blood-vessels at the site of injury followed by an exudate from the vessels of fluid and white blood cells, or leucocytes, which attempt to destroy the invading bacteria by engulfing them. In the fight many of these scavenging cells (the phagocytes of the *Doctor's Dilemma*) are killed and so the symptoms of inflammation—heat, redness, swelling, pain—are followed by pus-formation or an abscess. Infection in the lung (pneumonia), in the bowel (dysentery) and the lining of the brain (meningitis) are essentially similar processes. In addition to the local cellular response the invading micro-organism or its poisonous secretion provokes, after an interval of some days, the production of less easily definable substances called *antibodies*; these are protein particles thrown into the blood-stream from fixed tissue cells. For example, the "crisis" in pneumonia comes when the antibodies are present in sufficient amount to overcome the pathogenic pneumococcus. This antibody-response is specific for each type of bacterium or virus, and cells which have once learned to produce a particular antibody respond at once to any subsequent stimulus from the corresponding parasite. Therefore any attempt by a micro-organism to establish itself in tissues which have already made its acquaintance is met by a rapid outpouring of antibodies from the shadow-factory, and the invasion is repelled. This is the reason why with certain exceptions it is rare to have more than one attack of an infectious disease.

If the parasite is to survive in the struggle with its host, it must not only avoid killing and being killed, but it must also devise ways and means for getting from one host to another, and these methods are as various as the tribal lays. Some travel directly from one person to another by droplets during talking, coughing, or sneezing. Some are carried in dust-particles by air currents; some multiply in food and water and are ingested; others can live in the soil as resistant spores, and others again depend on insects or animals for their transference. Most of the parasites of man cannot live long outside the human body, which is their main reservoir. If then we are to attempt to control infection in a community, we need to find out and, if possible, destroy the habitat of the bacterium causing infection or block its channels of spread. Alternatively, we must so raise the resistance of the host that the bacterium cannot gain a foothold. All these methods, as we shall see later, have been used with varying success.

HEALTH HABITS AND HAZARDS*

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The immediate aims of those of us interested in the health of our people are the improvement to the maximum possible degree of the physical and mental development of the nation, the avoidance of preventable disease, and indirectly, the postponement of death; or, in brief, the achievement of optimum health.

Optimum health is not a state which occurs by accident, but is something for which we must strive. While scientific advances can give us invaluable aid, we must not forget that the fundamental basis of our effort must be an informed community, inherently healthy, living healthy lives in a healthy environment. The healthy community is made up of individuals healthy in body and mind, and the potential development of each member of the community depends largely on the quality of the stock from which he comes. It is well known to all of us that in recent years we as a nation have tended not to breed from the best stocks, because the presence of young children in the family so frequently resulted in poverty, a condition under which the best stocks quite reasonably refused to bring up their children. Now that the country is committed to a policy of family allowances in the promised (or is it half-promised?) land that lies ahead of us, we can look forward to an increased production of new life from those sections of the community capable of producing the best type of individual.

Habit—a Blessing or a Curse?

In our efforts to improve the physical and mental development of our people, we have available the natural phenomenon of habit to assist us. The performance of any act renders its subsequent performance easier, so that in time it becomes relatively effortless. Similarly, the adoption of a particular mode of behaviour renders us more likely to repeat it on a subsequent similar occasion. At the same time it becomes increasingly an effort to vary our behaviour. This capacity to develop habits is both a blessing and a curse, for if our habits are good we receive praise for something that is effortless, and if they are bad we are decried however great our efforts to reform, if they do not achieve what is almost impossible. We know from our observation of

* Paper read at a Regional Conference arranged at Leeds by the Central Council for Health Education.

people's habits of posture, handwriting, sleep, personal cleanliness and so on that habits can be either good or bad, and we know also how difficult it is to break them. They tend to become permanent patterns of behaviour, and their capacity to endure is increased the earlier they are established. The inculcation of good habits obviously can be carried out most effectively by parents, but unfortunately we must face the fact that a substantial proportion of parents are unqualified to do so, so that in many instances we must rely on agencies outside the home, such as nurseries and nursery classes, schools and all organisations whose activities are concerned with youth.

What are these habits that we must try to persuade people to cultivate, and which certainly should be built into the developing minds of children?

The habit of maintaining a well-nourished condition through the eating of good food is essential. This depends on two conditions; first the availability of an adequate supply of suitable food, and the money to purchase it. It is reasonable to hope that the continuation of some form of central control of the production of home-grown food and of the importation of other essential foods, coupled with a more equitable distribution of incomes by means of family allowances, will enable this condition to be satisfied. The second condition is that the people should have both the knowledge and the desire to buy what is good. This condition is the more difficult to satisfy, for experience shows that even where there are no financial difficulties, far too many people depend on the pie shop and the fish and chip saloon for the provision of what they are pleased to call a "cooked meal." Our housewives show no great keenness to abandon their old ways, and to learn new and better ways and I think it is true to say that war-time cookery demonstrations have reached only a negligible proportion of those women who would benefit from such instruction.

Future Possibilities

Our hope for the future appears to lie largely in the schools. The great increase during the war in the provision of school feeding has been such a success that its post-war continuation and further expansion seem assured; many children will thereby become accustomed to types of food which otherwise they never might taste. The promised raising of the school-leaving age will give our educationists more time to inculcate good habits in the children, which in the case of girls might profitably include habits of cooking. As a corollary, the three to four million houses that are to be built in the post-war ten years' housing programme promised by the Minister of Health should contain cooking and washing-up facilities which will enable future housewives to exercise fully and easily the talents acquired in school.

Good habits of sleep are necessary if good health is to be maintained. The effect of sleep deficiency is recognised by all teachers, who know that it can convert the potentially bright child into one who is definitely dull.

Its influence on production and the occurrence of accidents in industry is well known. Miners working at the coal face, in one area at least, have objected to doing duties which deprive them of their normal hours of sleep, on the grounds that they subsequently are more prone to accidents in the pit.

For the inculcation of good habits of sleep we are dependent to a very great degree on parents, and here propaganda must be used forcibly. Its success is likely to be greater if the children themselves have already become accustomed in a nursery school or class to regarding sleep as a pleasant part of the daily routine, and not as an unpleasant necessity that must be postponed as long as possible.

The wearing of clothing, suitable both in material and style, is an obvious health necessity, and the present-day tendency to prefer what is gaudy and cheap to what is plain and serviceable is to be deplored both on the grounds of efficiency and of good taste. The normal history of clothes usually is divided into three ages—the age of great occasions, the age of other occasions, and finally the age of being worn out at work. Particularly in women is there a marked difference in the type of clothing that is suitable for great occasions, and that suitable for the prosaic procedure of earning a living. In footwear this difference is particularly marked. Two points need to be stressed: first, so much time is spent at work that the provision of special clothing and footwear selected for this purpose alone is essential, and second, adequate changing (and in our climate, clothes-drying) facilities should be provided in all industrial undertakings.

In children, the inculcation of sensible habits of dress can be achieved by providing them with clothing that is simple and efficient in style, good in quality and wearing capacity, and easily washable, which means in effect self-coloured. This introduces the controversial subject of school uniform, and while it probably has disadvantages, its advantages seem to be very substantial indeed. Its design generally is good, for it is chosen by sensible people who are interested in the welfare of the children and have experience of what is suitable, it prevents foolish parents from clothing their children unwisely, and it eliminates those outward signs of financial distinction which may have very disturbing effects on sensitive children who incidentally are born to poor parents as well as to the well-to-do. Further, school uniform would enable controlled standards of quality, and possibly of price, to be enforced. Such arrangements, to which we have become accustomed in war time are no less desirable in times of peace.

Challenging Facts

In the inculcation of the habit of bodily cleanliness we are starting, as far as a substantial proportion of the population is concerned, from what literally can be described as scratch. At certain age groups among city children, 50 per cent of all girls and 25 per cent of all boys are verminous.

Even among adult women a proportion that is far from negligible remain verminous. The condition is highly undesirable, for quite apart from aesthetic reasons, it interferes with sleep, frequently leads to other skin diseases, and under certain conditions causes the widespread dissemination of serious epidemics.

The habit of bodily cleanliness depends upon a desire to be clean and adequate facilities for satisfying that desire. Such facilities are denied to many people to-day. In a house where bathing necessitates getting out a zinc bath, heating water in a kettle, sending the children to the pictures, drawing the curtains, and locking the only door, it is futile informing the housewife in a voice charged with sanitary hypocrisy that cleanliness is next to godliness when she knows only too well that it is next to impossible. By adequate facilities is meant that every separate dwelling has its own bathroom and proper supply of hot water.

The desire to be clean can be taught easily in schools. There are few children indeed who do not learn very quickly to enjoy a hot shower after games or physical training when such facilities are available as they should be. Swimming, besides being a useful accomplishment, also teaches children to be fond of water, even in its most unfriendly state—cold. It is interesting to pick out children who have learnt to swim well and to observe the low proportion of them who are verminous.

The very high proportion of girls infested with lice, and the unduly large number who do not get rid of the condition even in adult life, emphasises the importance of encouraging the fashion of short hair, and of discouraging those highly unnatural styles of hairdressing affected by many women (and indeed by quite young girls) which are so complex that even the use of a comb is avoided for days at a time.

The maintenance of good health requires the taking of adequate exercise particularly by people in sedentary occupations who in its absence develop feeble muscles, sluggish intestines, an inefficient circulation and eventually an ineffective mind, and who come to display in varying degree the characteristics of flabby, irritable hypochondriacs who spend their money in swelling the coffers of the purveyors of laxatives and cures for chilblains.

Our facilities for organised exercise and recreation are poor. The popularity of hiking, in spite of the absence of adequate hostel accommodation, shows that many city dwellers are keen enough to seek healthy exercise in the country even when no proper attempt is made to encourage them. The young adults who might be expected to take exercise in the form of the more strenuous organised sports, very frequently lose all their interest when they find, on leaving school, that it is necessary to join special clubs for the purpose. The youngsters' inability to pay the subscriptions, coupled with their shyness of joining clubs consisting of older people, usually bring their athletic careers to a premature close.

The schools which the vast majority of the children of this country attend have facilities that are inadequate to imbue a love of exercise except in children who either are particularly keen or gifted. One cannot avoid observing that those schools which set out to give the education that is desired by parents who can afford to spend the greatest amount of money on their children, pay particular attention to providing lavish accommodation for organised games. If this is considered desirable for children whose homes offer every facility for exercise and sport, how necessary is it for children whose homes possess no other playground than the paved street.

It seems obvious that our difficulties would be largely overcome if we could persuade our educationists that it is their duty to substitute for the small school field, bare of grass, remote from the school, lacking reasonable amenities, and frequently shared with other schools, an adequate area of grass-covered playing fields, attached to the school buildings, and including space reserved for the use of former pupils who thereby would be able to continue cultivating the habit of exercise without having to face the existing difficulties which to many young people, in practice, are insuperable.

Can We Reduce the Hazards?

Even if we inculcate in our population these and other good health habits, they still have to face many hazards, the risks of which, even if they cannot be abolished, can in many cases be greatly diminished.

Droplet Infections.—Much of the illness, with resulting loss of working time and earning power, which constantly is present in the community, is due to diseases spread by infected droplets scattered from the noses and throats of infectious persons in the acts of coughing and sneezing. The common cold, influenza, measles, whooping cough, scarlet fever and diphtheria are among the commoner diseases spread in this way. In most instances the individual can do little to prevent himself becoming a victim of infection when unknowingly he comes in contact with it, but a great deal can be done to diminish the frequency with which he is exposed to the risk. If we could impress on all people that when they have catarrhal conditions they should avoid mixing with crowds such as occur in places of entertainment, they should cough or sneeze into a handkerchief, and that in severe cases they should isolate themselves for a few days, the number of infections would be greatly diminished. Similarly, the abatement of overcrowding and improved ventilation in houses, schools and factories, though not within the power of any single individual, would reduce the incidence of these conditions.

Diphtheria.—In the case of diphtheria, the potential victim can and should protect himself. As we know that apparently healthy people can carry the infection and spread the disease, it is the duty of all parents to see that their children, who are at the age when the disease is most likely to be

contracted, receive the protection that immunisation affords them. When it is realised that the immunised child's risk of contracting the disease is reduced on the most conservative estimate to one-tenth of that of the unimmunised child, and its risk of dying is reduced to one-thirtieth of that of the unimmunised child, it will be seen that science here offers us a benefit which it is not only foolish but most reprehensible to refuse.

Tuberculosis.—T.B. is a hazard which results in much suffering and in 25,000 deaths every year, and with improved facilities for early diagnosis, increased accommodation for treatment, adequate financial assistance to its victims, and higher housing standards, many of these deaths should be obviated. Included in the 25,000 are a number, amounting to almost 2,000, due to the consumption of milk containing tubercle bacilli transmitted by cows in their milk. In view of the great value of milk in improving the nutritional state of children, its consumption in schools is being greatly increased, but naturally we wish to prevent the spread of tuberculosis and of other milk-borne diseases. But 40% of all cows in this country show some evidence of infection by tuberculosis, 1 cow in every 200 actually is producing milk containing tubercle bacilli, and the milk from different sources is frequently mixed before it is sold to the public, thereby greatly increasing the risk of infection. It is impracticable to hope for a supply that is safe at the source for many, many years to come. The danger can be eliminated however by compulsory pasteurisation, a process which leaves the nutritive value of the milk unaltered, diminishes its vitamin C content by no more than 20%, and as far as the vast majority of people are concerned produces no detectable alteration in flavour.

Pasteurisation is opposed by many people in the industry, particularly producer-retailers, who pretend to base their case on pseudo-scientific arguments. The only real objection that they have is that the costs of pasteurisation will diminish their margin of profit, an objection which obviously can be appreciated, but one which should not be cloaked by fallacious pseudo-scientific arguments.

Venereal Diseases—A Social Danger.—The occurrence of tens of thousands of cases of venereal disease each year, and the rapid increase in the number of infections since the outbreak of war, show that these diseases, with their disastrous effects both on those who contract them and those who inherit them, constitute a very grave hazard to the health of the community. The prevention of these diseases is, with the exception of inherited infection, entirely within the control of the individual concerned, for in the absence of extra-marital sexual intercourse obviously they are not contracted.

In dealing with these diseases, which owe their spread to the effect on human conduct of the most powerful of instincts, we must rely on a combination of methods of attack. The raising of the status of biology in schools will enable children to be taught to have a more healthy attitude to sex

problems, alterations in our social system will enable earlier marriage to be embarked upon, the adoption of higher standards of conduct and of greater degrees of self-restraint among the people will diminish the frequency of exposure to risk, and the provision of and use of adequate facilities for early treatment will diminish the extent of the reservoirs of infection.

It is futile to shut our eyes to the frequency of extra-marital sexual intercourse that occurs in the community. Even before the outbreak of war, in addition to the 27,000 illegitimate births that occurred each year, more than twice this number of women were pregnant at the time of their marriage, varying from 42% of those who married under the age of 20 to 8% of those who married between the ages of 30 and 40. When it is appreciated that these figures refer only to those extra-marital unions which ended disastrously, we begin to appreciate the nature of the problem that confronts us, and we realise that this aspect of the health of the community cannot successfully be left to moral exhortation entirely.

These, then, are some of the health habits that should be cultivated, and some of the hazards that should be avoided. It will be realized that they demand as a foundation a community that is well-informed and well-nourished, living and working under good conditions, provided with efficient health services, and, most important of all, receiving in youth an education liberal enough to find room for teaching children how to live.

In concluding, I would like to express the hope, however, that we see our subject in its correct perspective. While the optimum health of the community is a goal for which we all must strive, it is only one of the factors which contribute to that peace of mind which is the greatest benefit that man can enjoy.

BIOGRAPHICAL NOTES

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THE PSYCHOLOGY OF PHYSICAL TRAINING

By Major W. K. Garnier, R.M.
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Very few people ever pull their weight. Many go through life bored and only half-awake, and most are living at a lower level of vitality than they need.

A long experience in all sorts of conditions in the service in two wars and in civil life during the lean years between has convinced me that this tragic waste of human potential is largely unnecessary. An almost miraculous change can often be brought about by physical training of the right type. The lethargic, the indifferent, the inhibited, can become active, alert, and self-confident.

But these results—this new lease of life—will not be gained if the gymnasium is regarded merely as a kind of muscle factory. If its full benefits are to be obtained, physical training must be approached with some appreciation of the psychological factors involved. The teacher or physical training instructor must inspire as well as instruct. If he bears this in mind he has a great opportunity; but he must first sell the idea to his class. How can he best do this?

The Acid Test

Those of us who are working in the services or the schools can compel attendance, but we cannot compel interest. We must earn it. The acid test of our methods, therefore, is their success with a voluntary class.

A voluntary physical training class will be composed of a heterogeneous collection of individuals of all types, sizes, ages and conditions. Except in the case of unemployed, it will be held at night after a day's work, and if the pupils are not convinced of the value of this sacrifice of their spare time there will be no class. In other words, if the instructor fails to "produce the goods" he will not have a second chance.

To be successful with a voluntary class therefore requires no small amount of imagination on the part of the instructor. He must be a practical psychologist. For a start, he must be able to put himself into the skin of a potential member of his class—the young man who may have spent a long and drab day in an office or in some equally soul-destroying occupation.

Why, then, does anyone join a class? There may be others, but here are four reasons: the purely selfish desire to get fit—to improve himself physically; the altruistic motive to learn how to instruct others; the desire of a lonely individual to make friends; the curiosity of the experimentalist who is always ready to try a new experience—once.

The Secrets of Success

To hold together a voluntary class, there are seven essentials: recreation, results, organisation, urgency, variety, interior economy, and the instructor.

The importance of recreation is sufficiently obvious to require no explanation. Unless the evening is entertaining, or if it is dull, there will be no class on future occasions.

Results must be obtained—and quickly. Once prove to your class that they are going to get value—psychological as well as purely physical—and they will be transformed into enthusiasts. But this must be apparent on their first attendance.

It must be obvious to every member that everything is organised and objective. The reverse is the haphazard class, where nothing has been thought out, where times are not adhered to, and where the instructor gives the impression that he is merely filling out the evening with anything which comes into his head.

There must be a sense of urgency. For one thing, no one will be able to attend more than once a week, so that time is at a premium.

The syllabus must include as many other allied subjects as possible, e.g. boxing, ju-jitsu, competitive games, agility exercises, etc.

At all costs the gymnasium, hall or room, and its ancillary offices, dressing room, bath room, lavatory, canteen, etc., must be attractive. They should be spotlessly clean and well lit. This is axiomatic and the effect on the trainees is instant. They want to come again.

Most important of all is the instructor. His attitude, manner, tone of voice, even his stance, all create atmosphere, and the atmosphere of a gymnasium must be electric. He must look the part; he must be immaculately turned out; he must radiate vitality. Anything which savours of monotony or drabness is fatal, for above his head there hangs a sword of Damocles and, if he fails to interest and inspire on the first occasion, his class will just fade away. He must, too, have *understanding*, or that nice perception which includes such attributes as tact, sympathy and a sense of humour. Finally, he must indicate a profound conviction of the importance of what he is endeavouring to impart, and his instruction must be intense.

Inspiring Interest

Now, if these seven essentials are so necessary for the voluntary class, they are just as important for those who attend because they have to. Particularly is this so where very large numbers are involved, for unless the pupils like it, unless their co-operation can be obtained, the training will be fruitless. I believe that much can be achieved by a full and frank explanation, more especially of the psychological benefits. In particular, how the mere fact of being mentally alert is going to help them in their other work. This should be done before any physical training has taken place. On the

physical side, take anything, such as climbing a rope or vaulting over a horse and show the various progressive steps, which will have to be taken before it can be performed; for it is fair to state that very few untrained men will be able to carry out a single one of these. From the start, try to awaken their interest and to capture their imaginations. The verdict on any training can be seen in the faces of the trainees. Their eyes alone will show whether they are interested and receptive, while the reverse is always painfully obvious.

A Live Technique

There is nothing fundamentally wrong with the system of physical training in this country, but it must be adapted to the peculiar characteristics of British youth. A period should be quick, exciting and varied. There must be no awkward pauses, where interest lapses. Then again, a sense of humour on the part of the instructor must surely prevent any idiosyncrasies of speech or manner, all of which merely bring ridicule in their train.

Before the war the wolf cry of "militarism" was being continually raised; so much so that the pendulum swung to the other extreme, which frequently resulted in a technique which I can only call anaemic. There is no doubt that our young men dislike regimentation and what so many people are pleased to call "physical drill," which can be a travesty of physical education. But, equally, they object strongly to anything which is not red-blooded or which, by its presentation, is more suitable for an infants' school.

Because stamping and goose-stepping do not appeal to us, it does not follow that sloppiness is the only alternative. On the contrary, I have found that men's classes, even when their attendance was voluntary, much preferred a live and virile type of physical training. To do everything well to the best of their ability, to move like lightning from apparatus to apparatus, and to march with a free purposeful swing was what really appealed to them. Anything short of that was unlikely to "hold" a voluntary class.

Serving a Novitiate

And so I only wish that all who are concerned with physical training would serve a novitiate with voluntary classes. It is a hard school, but one which benefits the instructor as well as his pupils. Only teaching which is completely alive and worth-while will survive it. The dross, the trimmings, the affectations and the hot air will come away in that crucible. The instructor who survives this test will have learned how to inspire the interest and enthusiasm of his pupils: he will then be fit to take charge of a class that cannot escape.

VISUAL EDUCATION IN THE WAR FOR HEALTH

By G. Patrick Meredith, M.Sc., M.Ed.
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At the outset let me make clear the aim of this article. It is not to provide lecturers, propagandists, teachers and organisers with hints on the use of films, lantern slides, charts and models for brightening up their work. A mastery of these media requires more than an article. One day we shall have regional institutes of Visual Education to provide the necessary training in all these techniques. My present aim is to suggest a point of view. This point of view takes Visual Education to be something more than a mere auxiliary to other methods of Health Education. Just as electricity has proved to be something vastly more than a mere substitute for manual, horse or water power in industry, and has transformed industry; as the aeroplane has shown itself to be not merely one more weapon but a decisive transforming factor in warfare; so, according to the view taken here, visual education is destined to prove a transforming factor in all the major actions of mind on mind. This is a prophecy, not a plea. The desirability of this development is not the point at issue. We are concerned with its probability. It is a commonplace that the mentality of society lags far behind the progress of scientific technology. The point of view taken here is that visual education is the technical basis for the industrial revolution in intellect so seriously overdue.* If this view is granted the consequences for all forms of education —including health education—are far-reaching. It means that the so-called "visual aids" cannot be merely tacked on to any educational scheme. The scheme must be thought out *ab initio* with visual methods as an integral part. Moreover, new, interesting and complex problems arise, to be indicated in the sequel.

New Thinking

Global war has forced many one-track minds to start thinking in more than one dimension. Multi-dimensional thinking has an important bearing on Visual Education. Whatever may be said about the logic of looking for single causes in *disease*, no one could possibly attribute *health* to single causes. Perhaps this is why the handling of the positive problem of health maintenance has lagged so far behind the negative problems of the diagnosis and treatment of disease. In the latter some measure of success can be attained by one-track thinking. In the former, multiple causation demands multi-dimensional thinking.

* For a development of this view see *Sight and Sound*, Winter, 1942.

The Task of Health Education

The health educationist has, of course, a great deal in common with other educationists, and undoubtedly has much to learn from the teaching profession, but here too there are difficulties. The health educationist, generally speaking, has a much shorter period of contact with his victim than has the teacher with his. To be effective at all the former needs to think out the principles of his methods with much closer attention to the criterion of economy. Not financial economy but economy of time and effort. His aim overlaps with that of the teacher but is more specific and more practical. The teacher is concerned with a wide range of understanding and is generally satisfied with verbal and written evidence of achievement. The health educationist is concerned with a narrower range of understanding and cannot rest content until health statistics reflect positive changes in health habits. Thus, expressed in its simplest forms, the task of the health educationist is to attract attention, to create understanding, and to induce new behaviour, and this by methods characterised by concentration and economy.

A Museum for the Strategists

Health education, while narrower in its aim than general education, has a much wider field of operation than ordinary scholastic education. Health is a national problem, and the audience is the nation. The health educationist thus carries on his work through all the media of propaganda available. He uses the press, the radio, the hoardings, the cinema screen, the lecture hall, the classroom, the health centre, the hospital, the clinic, the consulting room, books, pamphlets, leaflets and perhaps even the pulpit (when it will work with him instead of against him). Health education has to frame long-term and short-term policies. It has to deal with permanent, perennial, topical and local problems. It has to bring about understanding of very simple health points with those whose intelligence is limited; understanding of more elaborate problems by people with more or less trained minds; and highly involved long-term bio-technical problems for the consideration of planners and authorities. Moreover, health education is based on a body of positive but incomplete medical knowledge of indefinite extent. It is, at least, doubtful whether any individual exists who has a complete grasp of that body of knowledge. Much of it is dispersed throughout the medical and associated professions. If health education is to achieve coherent results within measurable time, its strategy and tactics must surely be thought out in relation to a general plan. Such is the necessary condition for global war, and such must likewise be the condition for "global" health. If the supreme importance of the latter were once fully appreciated the resources devoted to it might become comparable to those at present devoted to global war. Such a hope is, at present, visionary, but health education can itself work towards that recognition. Meanwhile it is obvious that piecemeal

policies in health education may lead to tactics some of which cancel each other out. This is not necessarily due to stupidity, but rather to the nature of the work. If it is beyond the power of any individual at present to form a complete and balanced concept of the whole problem of health, some lack of co-ordination of the multitude of separate activities is only too probable. Can this be remedied? The answer is that health education, like charity, must begin at home, "home," in this sense, being the focus of the movement. In other words, the health educationists must give themselves a liberal dose of health education to start with, not with a view to improving their own health (except incidentally), but with a view to achieving a collective grasp of the entire problem and formulating appropriate policies. The analogy with war is a close one. This is indeed an unending war against the permanent enemies of mankind. An essential feature of all war-making, from global strategy down to the smallest tactical manœuvre, is the marshalling of intelligence. It is not without significance that those concerned with military strategy make very extensive use of visual methods (maps, globes, charts, models), for informing themselves about the situation with which they are dealing; and the manipulation of models enables them to perform symbolic experiments. Thus the suggestion here is that right at the heart of the movement the planning of grand strategy could be immensely assisted by a visual assembly of all the relevant data (visual statistics would play an important role in this assembly, but considering the relation of health to such factors as housing, industry, transport, etc., models would also have an important part to play). The planners would thus have before them a concrete embodiment of all the factors relevant to the planning. The alternative is to keep it all in their heads and the disadvantage of this lies in the impossibility of ensuring in any discussions whether the same thing is being discussed. In addition, the visual assembly can accommodate far more than any individual head and could be brought regularly up to date. It would take the form of "A Health Information Museum" designed by and for experts and all the discussions on health strategy should take place in the museum with the data all round.

The Range of Visual Education

Visual education covers a wide range of processes. In its simplest and most vivid form it consists in learning by looking at real things. From this most concrete form we pass by successive stages of indirectness to the model, the film, the still photograph, the drawing, the diagram, the graph, the schematic chart. The problems which arise at one end of this scale are very different from those at the other end. Since all learning must start from experience, in health education as in general education, there must be a liberal allowance of the more concrete forms of visual experience. To see the real thing is the most direct experience we can have, though for certain purposes the film

may be actually superior. In a film a sequence of related events can be brought together to be apprehended at a single sitting, events which it might be difficult or even impossible for any individual to witness even given unlimited time. Among these more concrete forms the choice is largely dictated by the purpose in hand and by the nature of the problem. Difficult questions of principle hardly arise. But the more subtle and interesting problems of visual education arise at the more abstract end of the scale.

Matter and Media

At this point it is necessary to draw a distinction. It is the distinction between matter and medium. The various media of visual education are the concrete means by which the required matter can be expressed. It is often possible to express one and the same item through several different media, e.g. a map may appear as an illustration in a book, or hung on a wall, or reproduced on a lantern slide, or film slide, or as part of a film, or as a relief model. The information conveyed in the map and the various symbolic techniques by which that information is expressed have to be thought out as quite a separate problem from the problem of choosing the best medium. The choice of medium is largely a practical problem determined by resources and facilities on the one hand and by aims and requirements on the other. Unfortunately this distinction is not always observed and a great gulf separates the thinking about films from the thinking about other visual media. It is true that the capacity of the film for handling time and motion must put it in a very special category. Nevertheless, fundamentally when the films sets out to say something it has to solve the very same problems which the wall chart and lantern slide have to solve, namely the problems arising when we set out to make *visual statements*. Visual Education is still insufficiently understood because it is thought of largely in terms of illustration. So ingrained is our habit of verbal thinking that we are apt to suppose that verbalism is inseparable from all thought. The artist, of course, does not fall into this error, nor does the mathematician nor do many others whose professional habits of thought involve non-verbal symbols. But as a species we are in the grip of verbalism and Visual Education is going to have uphill work for many years to come. Moreover, it is not a weapon ready to hand to be picked up and used in health education whenever the need is felt. True, the media are to hand, but where is the matter to express through those media? Even assuming that it is possible to formulate now in verbal and statistical terms the whole array of facts, doctrines and practices needed for an all-out campaign of health education, the translation of this matter into visual forms, or of as much of it as needs to be so expressed, requires a body of skill and experience and a team of translators. This is a problem which concerns not only the health educationist but all those concerned with instruction, information, propaganda and the like. A steady stream of charts

of all kinds is flowing into the market, and doubtless that stream will become a torrent and the torrent a flood. But so far only a tiny minority of these charts can truthfully be said to show any real grasp of the problems involved in making clear visual statements. It is a language which very few have learnt to use. We are fortunate in having in this country the Isotype Institute, whose founder, Otto Neurath, has explored this problem for some 20 years with results which speak for themselves. The future development of Isotype as, in the author's phrase, "an international picture language," will be fascinating to watch. Its relation to other techniques of visual expression is, at the moment, undetermined, but if the health education movement means business, as it does, and intends to produce definite improvements in the outlook and habits of this generation, it needs very sharp and well-constructed weapons, and cannot be content with hit-or-miss techniques. Both matter and media need to be thought out in relation to policy and strategy in just the same way as the general staff evaluate their resources and plan their objectives in relation to their aims. The need for such planning is particularly obvious when we consider the film. Here is the most powerful and the most expensive of our media. The film can bring world upon world before our eyes. It can handle the infinitely great, the commonplace and the infinitesimal. It can play all manner of tricks with space and time. Through the film millions can look through one miscroscope, hear one heart beat, witness delicate processes normally visible to a single eye. By animated diagrams it can explain in a few minutes processes formerly requiring lengthy and tedious verbal explanations. It can portray ordinary folk discussing, without embarrassment, taboo-infested problems; and mites burrowing into the skin. These and many more powers it has to offer—but their effect is vastly greater if they form part of a comprehensive programme.

Mental Patterns

It should now be clear that Visual Education is a great deal more than merely showing people pictures. We want to make people attend, think, understand and act. The claim is here made that Visual Education is for some purposes, a necessary supplement to the verbal process; and some reference has been made to multi-dimensional thinking. This is particularly important when discussing health because the problems of health are the problems of an individual in an environment subjected to a variety of influences. In other words, the health problem is nearly always a *pattern*. Dogmatic adherence to a particular school of psychological thought is not necessary to convince us of the importance of patterns in human psychology. Whether we call it a "gestalt" or a "schema" we find the typical mental process is essentially a pattern of activity. *Our aim in health education is to bring into existence, on a large scale, mental patterns which reflect the patterns of the health problem.* Moreover, these patterns are essentially active. On Professor Bartlett's view

the mind is thought of as "turning round upon its own schemata, and organising them afresh." To quote from a recent article of Oldfield and Zangwill in the *British Journal of Psychology*, "the result of the process is essentially a reorganisation of the material in a form more suited to the determination of adaptive behaviour in the organism." Surely this accurately describes the aim of health education. We have to set up active mental patterns leading to adaptive behaviour. Now the great disadvantage which verbal expression suffers is that being uni-dimensional it is very poorly adapted to the representation of patterns. Visual expression, on the other hand, by using all its resources of direction, light and shade, form and colour, is multi-dimensional and therefore peculiarly suitable for a representation of the typical health problem pattern. This is not to say that it is a simple matter to express any particular health pattern in visual terms. Just as words have a way of intruding their own peculiar properties into the structure of our thinking, so also do colour and form. Thus many technical problems arise in the making of clear visual statements. Just because it is a richer and more powerful medium of expression than verbal language, visual language is more difficult to handle. But if the health war is to be won, research on this powerful weapon is urgently needed, and its use must be integrated into the general strategy. If health matters, health education matters. If health education matters, its techniques of expression need to be just as up to date as the instruments of the surgeon and the drugs of the physician.

REGIONAL CONFERENCES ON HEALTH EDUCATION

(Preliminary Notice)

During the next few months the Central Council will call conferences on health education in each of the civil defence regions in turn.

The Ministry of Health and the Board of Education have both stated that the health and education committees of local authorities may each send three delegates to the appropriate conference without requiring special sanction for the payment of the reasonable expenses incurred.

Detailed particulars of the conference to be held in their region will be sent in due course to all local authorities.

THE TEACHING OF PARENTCRAFT

By Jean M. Mackintosh, M.D., D.P.H., and
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H.V.'s Certificate, Teacher of Mothercraft, Aberdeen

One of the most important branches of health education is the teaching of parentcraft. Instruction in mothercraft has always been given by maternity and child welfare departments either individually or in groups at welfare centres. More recently the question of the instruction of the father has been tackled in some areas.

It has been generally agreed for some time, however, that the proper time to begin such instruction is when the boy and girl are still at school. There is some difference of opinion as to the age at which this instruction should be given. We, in Aberdeen, think that the right age at which to give this instruction is 13 to 14 years. Of the girls in this city who leave school at the age of 14 years, 80 to 85 per cent receive this instruction. Owing to difficulties with the curriculum and lack of time on the part of the mothercraft teacher, girls who remain in school after the age of fourteen have so far not received this instruction. At twelve or thirteen years the child is very curious about the changes taking place in his or her body. The girl especially is very interested and curious about babies and small children and very eager to learn all about them. If one waits until they are fifteen years of age or older this curiosity will probably have been partially satisfied and in the wrong way. Of course, children ask about babies long before they reach the age of twelve, and their questions must be answered truthfully by the parent or teacher as the case may be, but the right time to begin class-teaching on parentcraft is, in our opinion, at puberty. Since the institution of these classes in Aberdeen in April, 1941, approximately 1,200 girls have received this instruction each year and experience thus gained by the teacher of mothercraft has confirmed us in our opinion that we are beginning at the right age.

Teacher, Doctor, or Nurse?

Another point on which there is difference of opinion is on the question of who is to teach these classes. Should it be a teacher or a nurse? Few teachers have knowledge of mothercraft and the nurse may not be a good teacher. Both professions are trying to get over the difficulty—the training colleges and especially the domestic science training colleges—by providing courses in mothercraft, and various nursing institutions and societies by

providing courses for nurses where they may receive instruction in the art of teaching. It seems to us that it depends on what is included in the course of instruction in parentcraft whether the teacher or the nurse would be the most suitable person to give the instruction. If the ground to be covered is the same as that given in the Aberdeen syllabus, discussed below, then in our opinion the teacher of parentcraft must be a nurse with health visiting experience and ability to teach. We have heard it argued that the day-school teacher should give most of the instruction and that a doctor or nurse should lecture on the purely medical aspects. We do not agree with this point of view. The ordinary teacher, even the teacher of domestic science as at present trained, with no experience of social work, cannot alone undertake this work, and to introduce a doctor or nurse for one or two lessons would accentuate unduly the medical aspects and interrupt that smooth continuity which is so essential to the successful running of such a course. As the course proceeds the children become friends with their teacher and ask questions easily and naturally, whereas if a new personality is introduced the children will tend to become less spontaneous, which would stultify the whole effort.

The Need for Collaboration

Although we think the properly trained nurse is the best person to direct this work, full collaboration with parents and teachers is essential if real success is to be attained. Teaching of parentcraft to parents in the Child Welfare clinics or elsewhere should include some advice on how to answer the questions which every child asks from an early age and which parents often find so embarrassing. In their training, all teachers should, in addition to receiving a course of instruction in biology, be taught how to answer similar questions which children may ask them. The collaboration with domestic science teachers in particular should be very close. They should teach their pupils how to make and launder clothes suitable for infants and young children, and how to prepare the meals recommended in the parentcraft course. Boys, too, in their handwork classes, should be given the opportunity of making some of the equipment used in the practical part of the parentcraft course. Even although domestic science teachers are not asked to give instruction on the care of the baby, yet it is essential that they should have a sound practical knowledge of this subject, including the handling of live babies.

The Methods Used

The following is an extract from a report by the teacher of mothercraft on her work:

"The first term's work in the eight junior secondary schools of the city was experimental. A survey of the ground to be covered was necessary,

and to do this I decided to undertake all the work myself. A simple course of lectures and practical work based on the syllabus of work proposed by the National Association of Maternity and Child Welfare was prepared. This syllabus was used for classes of usual schoolroom strength—about forty girls—and again to small groups of from ten to fifteen pupils. The large group teaching was quite unsatisfactory from the point of view of both pupil and teacher. It was exhausting work and lacked personal interest, declining into a mere demonstration and lecture. The small group, on the other hand, was found to be satisfactory. A small baby brother or sister or cousin was invited to class to be bathed, dressed and admired, so as to link school and home. To familiarise the child with Local Government Institutions, visits to Child Welfare clinics were undertaken, and continued when such visits were proved of value.

"Following on the first term's work and after consultation with the Maternity and Child Welfare Officer, H.M. Inspector of Domestic Science subjects and others, a further syllabus was drawn up, calling for the collaboration of the teachers of domestic science subjects in particular. At the same time the teachers of biology were approached to see in what way their teaching might dovetail in with the instruction given in the Mothercraft Class with regard to bodily functions, the relationship between mother and child and other relevant matters. To give point to this teaching, films such as "Sex in Life" and "Human Reproduction" were used either by the teachers of biology or by the teacher of mothercraft. Further outside links were forged. Where possible the girls attended the nursery schools to observe the occupation and training of small children, and to enjoy their company. The small babies in the nursery at the Maternity Hospital were visited, and with the advent of war-time nurseries an attempt was made to use these centres for practical work. On the School Parent's Day mothers were interested in the mothercraft class and generally agreed that such teaching was of value to their daughters.

"At the present time the lectures and practical work of the Mothercraft Course is divided between the domestic science teachers—including the needlework teachers—and the teacher of mothercraft herself; some of the teachers of biology deal in their regular teaching with the reproductive system, following the respiratory and circulatory systems. Where this co-operation takes place no one aspect of the subject appears out of perspective. Freed from dealing even theoretically with such matters as the preparation of toddlers' meals and the washing of babies' small garments, the teacher of mothercraft can include in her syllabus extra lessons on the subject of general health and personal hygiene. Individual problems such as "growing pains," uncomfortable feet and complexion troubles can be dealt with, and all anxieties concerning menstrual hygiene can be dissipated. Even where reproduction has been dealt with in the correct impersonal fashion in the

science class-room, a lesson on "growing up" is eagerly asked for, and the adventure of passing from childhood to adult life becomes something to be enjoyed instead of being marred by small worries and perplexities. Lately, no doubt owing to publicity given to the subject, many questions have been asked by these fourteen-year-old girls concerning venereal disease. It is dealt with as an acute infectious disease, differing from other infectious diseases in that it need never be contracted or passed down from one generation to another. With their simple and correct anatomical knowledge of the reproductive system it is easy to describe how such infection is met with and how by forming an idea of a standard of conduct which makes for happiness, the thought of venereal disease need never cross their minds.

"At the present the work awaits the help of a second teacher of mothercraft so as to allow for expansion of the work to include older girls and to merge the class of Mothercraft into a scheme of health education throughout the school."

New Opportunities

Courses of Health Education for the age group 14–18 should be given in Youth Organisations, and can be most satisfactorily built on foundations laid in the day school. The aim of such a course should be to train the adolescent in good citizenship and therefore must include parentcraft and his responsibilities, social and moral, to the community in which he lives.

A further opportunity for the teaching of parentcraft is presenting itself at the present time, which should be grasped. In this area we had an application from a group of members of the A.T.S. for some talks on Mothercraft. The series of lectures was opened by the Maternity and Child Welfare Officer, who gave a talk on the history and aims of the Maternity and Child Welfare movement. The girls were asked what they would like to be taught, and they said they wanted to know all about babies from the time they were first conceived. The Superintendent Health Visitor, who is also the Supervisor of Midwives, gave them a series of talks on menstruation, reproduction (including an explanation of normal labour), preparation for the confinement, the normal infant, bathing, dressing, feeding and the care of the young child. The films "Bathing and Dressing a Baby," "Breast Feeding," "Sex in Life," "Human Reproduction," "Circulation and Respiration" were shown. Finally, the Maternity and Child Welfare Officer gave a talk on the responsibility of the individual to the community, how irregular sexual behaviour led to unhappiness and tragedy in a number of ways, including the risk of venereal disease and how the baby was so often the innocent victim of the misdemeanours. This course was immensely popular and was packed out night after night. A question box was provided for those who were too shy to ask questions directly, and a whole evening had to be devoted to answering the questions. It would not always be possible because of mobility of

personnel and lack of instructors to give such an elaborate course on every occasion, but there is no doubt that even a modified course is very well worth while and should be considered by the other Women's Forces. It is unlikely that they would be able to undertake such work with their own medical personnel, but an appeal to progressive local authorities is not likely to go unheeded.

Another worth-while group for lectures of this type is the large number of women engaged in munitions, and a beginning has been made in this area. Owing to limited time and shortage of staff a course of three lectures only is contemplated in the first instance. The primary purpose of these lectures is to give instruction in general hygiene and the dangers of venereal disease, but it has also been found possible to get across the general principles of good parentcraft and the responsibility of the individual to the community. It is only possible to do this in very general terms, the idea being to whet their curiosity so that they will ask for more if given the opportunity.

The teaching of Health Education should begin from the earliest years and continue right through the child's school life. From there the story should be taken up by the Youth Organisations so that when the adolescent grows old enough to assume the responsibilities of parenthood they will do so gladly and with confidence. Only by planning in this way from the early years can we hope to make our full contribution to the health and happiness of succeeding generations.

BIOGRAPHICAL NOTES

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HEALTH EDUCATION IN THE TRAINING OF TEACHERS

By Winifred M. Warden, M.Sc., F.L.S. *Lecturer, University of London Institute of Education*

At first sight the position with regard to Health Education in the training of teachers would seem good in that no teacher leaves College without having had some instruction in this subject. But there are certain difficulties from the point of view of both lecturer and student which in many cases prevent the future teacher from getting a sufficiently wide background and a full concept of his role as an educator in matters of health.

The present position may be summarised as follows. Students in the two-year Training Colleges who are to become teachers in Infant, Primary or Senior Schools while undergoing further education in academic subjects, usually with some choice, at the same time all have courses in the principles and practice of Education. In the latter category comes the course in Health Education, which is compulsory for all. The content and outlook of the course varies widely in different colleges. The lecturer in charge of the subject is rarely in the first instance a specialist in Health Education. The work is done by someone who is primarily responsible for another subject; most often it is either the science lecturer or the lecturer responsible for physical training. From this fact two things result. First there may be a bias, since each lecturer is likely to be influenced by his main interest. For instance, in the women's colleges the main emphasis among the sciences is usually on biology, and while agreeing that much of the knowledge necessary for the full appreciation and understanding of health is biological in its background, it not infrequently happens that the biology lecturer places most emphasis on the physiological facts and neglects or is unable to follow up the practical implications. In the men's colleges the work is often done by the physical training expert, then the emphasis is likely to be on the purely physical fitness side of health. These, of course, are only generalisations, but it is inevitable that any lecturer will teach most convincingly what he really knows and the second factor which makes it difficult for the training college lecturer is that he, like all teachers, is at present unable to take courses in any branch of Public Health, even that connected with the health of school children, and it is not always easy for him to get at all the information he requires.

To balance this many colleges enjoy the co-operation of a qualified medical officer who supplements the resident lecturer's work by dealing with

such matters as the work of the School Medical Service and so forth. At its best this can be an ideal arrangement, but there are often difficulties from the point of view of the doctor concerned. While he has the knowledge and opportunity for first-hand information in all aspects of health, in the first place such lecturing is only a small part of his total work, and secondly the doctor is not a trained teacher and may or may not be able to present his knowledge in such a way that it is understood and appreciated by these rather immature students.

Instruction Too Academic

Another fact which makes for difficulty is that it is by no means certain whether the students in training have sufficient scientific background for the proper understanding of health problems. Much of this is biological in nature, and it is a matter of chance whether the student has learned any biology at school, and in the colleges themselves it is, with few exceptions, an optional subject. In addition, the present biology courses, whether at school or college, tend to be devised to be useful to a future specialist rather than to the average individual. They are based on morphological studies of types of animals and plants, chosen because they form a basis for future specialised study. It is true that in the last ten years or so there has been a move in the direction of emphasis on function as well as on structure, but there is too little attempt to relate the study of biology to the needs of everyday life and to realise its social implications. This is largely due to the fact that the University concept of biology is still imposed on the schools and the courses are therefore too academic.

The situation in the University Departments which train teachers for secondary and central or senior school work is not fundamentally different. The same comments apply to the lack of suitable biological background on the part of the students; indeed, this is often more pronounced as these are graduate students and with the exception of the few who are specialists in biological subjects, as a rule they have had no opportunity at all of studying biology during their three years of specialised training at the University or even in their later years at school. The problem of staffing is also often more acute. In the two-year colleges, since the students' academic education is continued, there is a greater choice of staff; in the smaller University Training Departments it is a matter of chance whether there is anyone with the right knowledge or enthusiasm to deal with the subject adequately. It is not infrequently regarded as a cinderella subject to be given to the last comer or to anyone with a light time table. If there is no one on the staff to do it, the whole course may be taken by a medical officer. The difficulties here have already been discussed.

The shortcomings in the present situation which have been discussed above are largely administrative in scope and could be overcome by a full

realisation of the importance of Health Education in the training of teachers, and therefore greater care in the selection of staff to deal with it; greater opportunities for the lecturers concerned to acquire the necessary factual knowledge; greater co-operation between the teaching and the medical profession. The necessity for a change of focus from the specialised type of academic biology to a more social outlook is being recognised not only from the point of view of Health Education, and it is beyond the scope of this article to deal with it in detail.

A Unique Opportunity

Probably the most important aspect of Health Education which the training colleges, with the time and means at their disposal, too often neglect is the absolute necessity for all future teachers to have a full appreciation of the *methods* of dealing with health in the school; for the students to realise that they have a unique opportunity of encouraging good habit formation in children, of helping the children, in full co-operation with parents and doctors, to overcome the difficulties that arise from even slight deviations from good health and above all to form in the coming generation a desire for positive good health and the means of achieving it.

The old way in the training college was to give abstract knowledge with main emphasis on physiological facts. A different training is needed to make the future teacher aware of the new problems and insights which have emerged in the field of health studies in the last decade and to make him aware of the potentialities there are for him as a teacher to act on this new knowledge and to build up a new attitude towards health in the community at large. The new outlook should be more concrete in the following respects:

(1) It should immediately relate the theoretical knowledge of the body to the needs of the whole personality be it child, adolescent or adult. The new tendency is no longer to treat a condition of ill health as an isolated phenomenon but to think of the patient as a whole, to emphasise the whole physical condition rather than to concentrate on isolated symptoms. Both parents and teachers have day-to-day opportunities of watching those slight variations in the behaviour of the child which are indications of the state of health. The teacher has the advantage of being in the position of receiving special training in this and having, through access to the School Medical Service, the opportunity of getting expert help for the child.

(2) It should bring home to the student that the teacher is gradually becoming a social bond between the school, the home and the doctor. The teacher should be trained to give information to the doctor and to the parent about the child's health and character.

(3) It should make the student aware of the great significance that the psychological attitudes have in the maintenance of health on the one hand

and in the development of illness on the other, and the chances of its cure. This is none the less significant for the teacher's own health as well as that of the children in his charge. To-day we know that an optimistic or pessimistic attitude in a great many illnesses is absolutely fundamental and that there are definite psychological types with regard to illness which deserve different treatments by the doctor. It makes all the difference whether a person is fussed over and encouraged to think of himself as delicate on the one hand or on the other to disregard, in a spartan way, symptoms which may be real indications of something wrong.

(4) It should emphasise that the theoretical knowledge should be related to the social contexts in which illness occurs, especially in cases where a child has to go on living with an incurable ailment or disability. The difference between the teacher and the health worker on the one hand and the doctor on the other is that the latter tends to deal only with the illness whereas the former can try to help the child to find such readjustments as are necessary for him to get on in life in his own specific situation. For instance, in the case of a child with heart disease, while it is necessary to change his habits with regard to physical activities such as games, he must also be provided with those substitutes or new interests which will compensate him for the satisfaction he would get from the physical self-expression other children have. He must be encouraged to realise that he is not unique and unfortunate, that most people have some disadvantage and that the art of living involves making the fullest use of one's positive assets. In this way can be prevented the development of social inferiority feelings which are often a greater handicap than an illness itself.

(5) Last but not least should be encouraged the new attitude with the slogan of "prevention rather than cure" or "positive health and not illness." This must be the comprehensive theme of the new discipline in health education. The ideal of the new social health movement is that steps should not only be taken when things are wrong but that conditions should be built up from the beginning under which positive health can flourish. This involves a new attitude on the part of the public towards doctors, who should be regarded rather as helpers whose aim is to keep people healthy than as magicians whose advice is only sought when pain makes the patient, in a panic, seek help. Such an attitude can be greatly encouraged by teachers, especially if the prevailing seclusion of teachers and doctors can be changed into a constructive co-operation.

TRAINING FOR CHILDBIRTH

By Kathleen Vaughan, M.B.(Lond.)

Each year in England and Wales about 600,000 women engage in the athletic feat of giving birth to a baby. They approach their task with very different degrees of preparation. Some are looking at it as if it were an illness, others are indifferent, or they feel it to be a troublesome task entailing minor degrees of ill health. Others, the true athletes, are full of joy and expectation and confident that they can carry out their appointed work successfully and well. Is not this the spirit in which the relays of bearers of the sacred torch leapt to their task, the spirit in which the great sculptor approaches his block of marble from which will spring the embodiment of his genius? He embodies his idea in marble, while women are bearers of the life of the race.

Now what we want is not so much *more* births but *better* births. Healthy mothers who have easy confinements, with but little pain, quick recovery, and just as important, healthy babies brought into the world naturally and easily, able to kick and roll and eager to feed almost at once. In other words, perfect infants who give no trouble.

How is this to be brought about?

First, we must understand that childbirth is a natural process—*not an illness*—and we must take a wide view of the subject if we wish to learn why it is normally quite easy, and yet often so difficult.

A strong, healthy girl should have her first baby with but little trouble, and subsequent labours should become easier and easier, if other conditions also are favourable. In the East I noticed many country women never needed a doctor or nurse for their confinement. They chose a clean place or reed mat, or sat under a tree or by a stream. They crouched or knelt or squatted and brought forth the child with no difficulty. They then severed the infant's cord with a piece of tin or sharp bamboo, waited a few minutes for the afterbirth to come away, and then washed themselves and the infant and walked home carrying the newly born. This is Nature's method. These were peasant women working hard all day in the fields, out in the open air from birth, inured to hard exercise and the plainest of food, rolling and tumbling in the sun when young and at 8 years old expected to do simple tasks in the fields or on the boats.

But what a contrast was seen in the richer women who lived in the same village or town. They had great trouble in childbirth, were often ill, living idle lives much shut up indoors. In fact, the worst cases came from those who had adopted what they considered European manners and customs,

such as too much clothing, rich diet and all food cooked and overcooked, thus destroying the valuable vitamins which help to build up strong bones and teeth. In most cases these ladies were deprived of sunlight, because all over the East fair skin is admired in a bride, and the women are kept idle and indoors while they develop the pallor so much sought after.

Why do the open-air women enjoying freedom from infancy have their children so easily, while the refined, rich, luxurious women of the same town and country suffer so much and so grievously, often giving birth to dead babies?

Because to have a normal and easy birth the woman needs three things—

A well-developed and normally shaped body.
Flexible joints.
An unconstrained attitude for delivery so that the pelvic joints can stretch open and let the baby come through.

We know that the arms are attached to the shoulder girdle and, in the same way the legs are attached to the pelvic girdle or pelvis. Why called pelvis? Pelvis is Latin for basin, and if you look at a human skeleton you will notice that the two lateral portions with the lower part of the spine or sacrum completed by muscles and ligaments as the floor, form a bowl or basin in which various organs and the intestines rest. This bowl is like a cup, and the baby's head will rest in it before birth, much as an egg rests in the egg cup. In the act of birth (or parturition as it is called) the bony framework or sides of the cup expand at three joints, the floor of the cup then softens, gives way, opens and lets the baby through.

You will understand how important is the shape of the cup because it has to receive the baby's head, and how everything should be done to make the joints flexible and elastic and to keep the muscles in good condition.

Quite early in pregnancy the joints of the pelvic girdle soften and become more mobile and have a tendency to separate, especially if the mother is an active woman. The bony part of her anatomy through which the child must pass to be born, viz. the pelvic girdle, expands slightly at these joints, and if the birth takes place while the mother is young and the pelvis is still flexible and capable of expansion, the birth of a large child through a small pelvis may be quite easy.

Now this natural increase in flexibility of the pelvic joints which is normal in every expectant mother, can be much increased by appropriate exercises to make her childbearing easy. The essential principle on which these movements are based is the loosening of the joints of the pelvic girdle, of the spine and hips.

The important exercises are those in the squatting position. Races who squat daily for their morning evacuation are found to have easy confinements because this position stretches the pelvic girdle.

Then, lastly, comes the question of posture in childbirth. We want the mother to take up a position in which her labour will be easiest—squatting, crouching and kneeling, all these positions are good for stretching the pelvis and opening the way for the infant.

Childbirth is an athletic feat performed best by the mother herself, and we find that in remote country places, in the East as well as on the Continent and in the British Isles, the postures naturally taken by the woman in labour are those depicted in ancient sculpture—crouching, squatting, kneeling.

This being so, who is responsible for difficulty in childbirth? It is no chance thing, but a definite result of several causes.

For natural birth a normal healthy body is necessary. How much is being done now by parents, teachers and nurses to see that the infant has the right surroundings, the right food, plenty of open air, suitable clothing and room for free movement? We must understand that of all foods breast milk comes first, and is more valuable than money and possessions to the baby, for it insures a good strong body, courage and an active brain. Air and light on the body are essential also in order that bones and teeth develop normally and are strong.

Later on, how much the teacher can do on hygienic lines, alternating short periods of sitting still, with longer intervals of play, movement and games, developing body and mind simultaneously. Remember that both the mother and the athlete are made by 14 and 16. If perfect health and co-ordination of muscular movement is to be attained, the framework of the body, the bones, should be well formed and strong, the muscles and joints pliable and the pelvic girdle well developed.

Doctors and midwives can do much—but even more can be done by the mother and teachers responsible for the health of the growing child from birth onwards. Her motherhood, whether it is to be difficult or easy, is so largely in their hands.

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REVIEWS

So You've Got a Baby: The Problems of Baby's First Year, by Arthur Gee, M.R.C.S., L.R.C.P., D.P.H. (Bristol: John Wright & Sons, Ltd.; London: Simpkin Marshall, Ltd. 1941. 9d.)

This is a little booklet of 32 pages, containing ten chapters, which deals with feeding, clothing, environmental hygiene of babies, and then passes on to weaning, minor ailments, help from the State and even travelling. It is a simple book written in an easy flowing style understandable by every mother. The book is a useful book that will allay many fears and give much help.

Mothers who feed their babies on breast milk are classified as the "lucky ones." I think that even to-day I should have preferred to have seen them referred to as the normal ones.

The author accepts the principle that children who cannot be fed on the breast should be put on a dried milk food, recommending either National Dried Milk or one of the proprietary foods. In this he is following a trend of thought which is being accepted more readily each day.

There is a most interesting chapter on baby clothing, but I think the author would have done well to have informed his readers that they can obtain 60 clothing coupons for the new-born baby as soon as pregnancy is definite, and a hint as to how these coupons might be used.

A very sensible chapter on baby's bedroom is followed by an excellent one on weaning.

The chapter before the last is on travelling with baby. The general advice is to avoid it, and the suggestion that aunts, uncles and grandparents who want to see the baby should come to the baby rather than for the baby to be brought to them is a very good one. Where travelling is unavoidable some very good hints are given.

I was somewhat surprised and disappointed in reading the chapter on vitamins not to find some reference to the fact that the amount of vitamins a child needs is in inverse ratio to its age, i.e. the younger the child or the less its weight the more vitamin protection does it need.

The book is a good one, and should have a good circulation, and will be helpful.—D. H. G.

Venereal Disease in Britain, by Sydney M. Laird. (Penguin Books, Ltd. 1942. Price 9d.)

The arrival at the present time of a "Penguin Special" on venereal disease in Britain could not have been more opportune, and few are so well qualified to write it as Major Laird, the author of this informative and challenging publication. It is his belief that once the British public becomes aware of the grave defects in our present come-and-go-as-you-please methods of "controlling" venereal infections, government will be compelled to take more effective action. Logically he builds up an unanswerable case for the introduction into this country of measures based on those successfully used in Sweden (details of which are given in an appendix).

The "venereal diseases cause more human suffering and tragedy than any other group of diseases . . . what can be done to reduce all this suffering? What is being done to control venereal disease? Cannot more be done than at present to reduce the amount of venereal disease? How can you play your part in improving the position in Britain?" The answers to these questions will be found in this book.—R. F.

Growing Up in New Guinea, by Margaret Mead. (Pelican Book, Penguin Books, Ltd., 1942, 9d.)

It is encouraging to know that Dr. Margaret Mead's survey of the Manus educational system has been published

in a Pelican edition, where it is likely to be widely read by the general public. It is to be hoped that other books of the same kind will be similarly republished. Her account of the methods used by this lagoon-dwelling tribe in producing adults who conform to the local standards, together with her comparison of the corresponding education in the United States, cannot help disturbing many who, even to-day, retain a surprisingly provincial satisfaction with our own Western culture. The implications of the book extend far beyond child education.

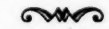
In surveying savage education, Dr. Mead was a pioneer, and it is perhaps ungracious to question her observations and conclusions too closely. At the same time, it would be unwise to forget that she lived with the Manus for only six months, and that, though we are told the vernacular was used, in the beginning pidgin English was her only means of direct communication.—S. M.

BRITAIN'S SCHOOLS: A MEMORANDUM BY THE COMMUNIST PARTY OF GREAT BRITAIN. (Central Books, Ltd., Panton Street, W.C.2. 1943. price 6d.)

This memorandum of some 40 pages is issued by the Communist Party of Great Britain; an appendix on Educational Administration, School Health Services, Religious Instruction and the Teaching Services, refers only to England and Wales.

The pamphlet sets out the Communist Party's views on the need for educational advance, on present action and on "a single national school system democratically controlled." Many of the suggestions put forward appear in other educational programmes: comprehensive school health services, the replacement of obsolete schools, no dual control and more generous academic and professional training for teachers. The suggestions provide, too, matter for the controversialist: abolition of religious teaching, control of Universities and suppression of Public Schools.

The picture is incomplete, but if it stimulates to further enquiry those for whom the pamphlet is primarily intended, as well as others into whose hands it comes, its usefulness will be enhanced.—J. S. H.



BRITAIN'S HEALTH SERVICES: A MEMORANDUM ISSUED BY THE COMMUNIST PARTY OF GREAT BRITAIN. (Central Books, Ltd., Panton Street, W.C.2. 1943. Price 6d.)

As a contribution to the study of immediate and post-war problems connected with the nation's Health Services, this memorandum loses much of its value in that the author fails to separate propaganda for an improved and unified Health Service from propaganda for the Communist Party.

The subject matter of the memorandum appears to have suffered too, from delay in publication, since many of the recommendations, for example, registration and salaries of nurses, are already matters of approved Government policy either for immediate or post-war action.

The summarised statement of the existing Health Services, which, from the title of the pamphlet one might assume would receive more prominent and detailed attention, omits altogether any reference to the Maternity and Child Welfare work so widely undertaken by Local Welfare Authorities.

As a critical survey with a pronounced political bias the object of the author has no doubt been achieved; but as a guide to the reader in search of knowledge of ways and means for enlarging and extending the usefulness of Britain's Health Services, this memorandum is disappointing.—C. H. H.

SOVIET SCIENCE, by J. G. Crowther. (Penguin Books, 1943. 9d.)

This "Pelican" is an abridgement of the book of the same title first published in 1936, and is inevitably out of date in some respect. Thus in the biological section (which will be of greatest interest to readers of this journal), the work of Lysenko on vernalisation is mentioned, but not his rather unorthodox genetical views; while Filatov is mentioned only in connection with his early work on ear capsule induction, his brilliant research on transplantation of cadaver eye tissue not being noted.

Nevertheless, it is a good thing that this book should now reach a wider public. The introductory survey of the planning of Soviet science and of its underlying dialectical materialist philosophy is excellent, and the results should go far to remove any doubts about the desirability of planning scientific work which may still exist in some British minds.

The account of the enormous research organisation directed by Vavilov, with its 10,000 scientists and 8,000 general assistants, its million varieties of wheat, its expeditions to China, South America, Asia Minor, Abyssinia and elsewhere, is breath-taking in its scope. With an organisation like this, and with men like these, there is yet hope for a stricken continent.—C. B.

THE PRE-NURSING COURSE. (Pamphlet compiled by a sub-committee of members of the Association of Women Science Teachers. Produced by John Murray at 9d.)

The explanations given on the Board of Education Circular 1471 (and its Appendix), together with Form 19, S/T are clear and concise. The *analysis* of the time-tables of schools giving full time one-year courses is excellent, and will enable teachers to form a selection of work which should be suitable. The only example of the work proposed for a part-time two-year course is poor, as so little attention is paid to the continuance of the general education of the student which is important in all pre-nursing courses.

The information given in regard to practical (and/or experimental) work is useful, but does not give sufficient detail. The authors could have been more helpful in this important matter. The nursing press should not be recommended to girls of school age. It is doubtful also whether nursing text-books, other than the First Aid and Home Nursing books used by members of the British Red Cross and St. John Ambulance Association are suitable. Some of the recommendations of the Association of Women Science Teachers (see page 18) do not take existing facts into consideration. There is nothing, for example, in the course of studies followed by Teachers of Domestic Science to qualify them as teachers of hygiene to students in pre-nursing courses. The recommendation regarding the advisability of Teacher's Courses in Anatomy and Physiology being held in medical schools will be endorsed by everyone. That the content of such courses be considered in conjunction with the General Nursing Council demonstrates how ready and willing teachers are to help to prepare girls well for their entry to hospital life.

The publication of this pamphlet suggests that schools need guidance, and the Association of Women Science Teachers has made the first contribution towards supplying this need. This is pioneer work upon which the authors can be congratulated.—E. C. P.